

What is claimed is:

1. An agglomerate tile structure fabricated of intermixed materials, comprising:
 - (a) at least 10% by mass of a binder material;
 - (b) at least 12% by mass of a phase change material (PCM) component; and
 - (c) at least 30% by mass of a granular base medium comprising at least one granular-sized stone.
2. The agglomerate tile structure of claim 1 wherein:
 - (a) said phase change material (PCM) component comprises a phase change material selected from the group consisting of a microencapsulated paraffin wax and a solid-state PCM; and
 - (b) said granular-sized stone is selected from the group of stone types consisting of quartz, granite, limestone, marble, glass, ceramic, and semiprecious stones.
3. The agglomerate tile structure of claim 2, for use as a flooring, and wherein:
 - (a) said phase change material (PCM) component comprises said micro-encapsulated paraffin wax;
 - (b) said binder material comprises a binder selected from the group consisting of polyester and epoxies; and
 - (c) said granular-sized stone is further selected from the group consisting of powdered quartz, crushed quartz, chips of quartz, and fragments of quartz.
- 25 4. The agglomerate tile structure of claim 1 wherein:
 - (a) said phase change material (PCM) component comprises a micro-encapsulated paraffin;
 - (b) said binder material comprises a polyester; and
 - (c) said granular-sized stone is selected from the group consisting of powdered, crushed, chips, and fragments of stone.
- 30 5. The agglomerate tile structure of claim 4, for use as a flooring, and wherein:
 - (a) said microencapsulated paraffin comprises octadecane microencapsulated within a thermoset plastic; and

(b) said granular base medium further comprises a second granular-sized stone of a granular size different from said first granular-sized stone, said second granular-sized stone selected from the group consisting of powdered quartz, crushed quartz, chips of quartz, and fragments of quartz.

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6. The agglomerate tile structure of claim 1 wherein:

(a) said binder material is at least 12% by mass of the intermixed materials;

(b) said phase change material (PCM) component is at least 15% by mass of the intermixed materials; and

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(c) said granular base medium further comprises a second granular-sized stone, said first granular-sized stone comprises chips of quartz and said second granular-sized stone comprises powdered quartz.

7. The agglomerate tile structure of claim 1 wherein:

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(a) said binder material is at least 20% by mass of the intermixed materials;

(b) said phase change material (PCM) component is at least 20% by mass of the intermixed materials; and

(c) said granular base medium further comprises a second granular-sized stone.

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8. An agglomerate tile structure fabricated of at least an outer layer bonded to a second layer, comprising:

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(a) the second layer comprising at least 20% by mass of a binder material, at least 20% by mass of a phase change material (PCM) component, and generally absent of a granular base medium; and

(b) the outer layer comprising at least 10% by mass of said binder material and at least 40% by mass of said granular base medium comprising at least one granular-sized stone, and generally absent of said phase change material (PCM) component.

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9. The agglomerate tile structure of claim 8 wherein:

(a) said phase change material (PCM) component comprises a phase change material selected from the group consisting of a microencapsulated paraffin wax and a solid-state PCM; and

(b) said granular-sized stone is selected from the group of stone types consisting of quartz, granite, limestone, marble, glass, ceramic, and semiprecious stones.

5 10. The agglomerate tile structure of claim 9, for use as a flooring, and wherein:

(a) said phase change material (PCM) component comprises said micro-encapsulated paraffin wax;

(b) said binder material comprises a binder selected from the group consisting of polyester and epoxies; and

10 (c) said granular-sized stone is selected from the group consisting of powdered quartz, crushed quartz, chips of quartz, and fragments of quartz.

11. The agglomerate tile structure of claim 8, for use as a flooring, and wherein:

15 (a) said phase change material (PCM) component comprises octadecane microencapsulated within a thermoset plastic; and

(b) said granular base medium further comprises a second granular-sized stone of a granular size different from said first granular-sized stone, said first and second granular-sized stone are each selected from the group of stone types consisting of quartz, granite, limestone, marble, glass, ceramic, and semiprecious stones.

20 12. A tile structure for use in a barrier between a circulation plenum within of a living space, comprising:

25 (a) a base support member having oppositely facing outer surfaces, one of said surfaces directed inwardly toward the circulation plenum;

(b) distributed about and extending from said inwardly directed surface are a plurality of fin protrusions; and

(c) said fin protrusions comprising at least 20% by mass of a binder material and at least 20% by mass of a phase change material (PCM) component.

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13. The tile structure of claim 12 wherein:

(a) the barrier is a ceiling of the living space, the circulation plenum is above the ceiling and the living space is beneath the ceiling; and

5 (b) said phase change material (PCM) component comprises a phase change material selected from the group consisting of a microencapsulated paraffin wax and a solid-state PCM.

14. The tile structure of claim 12 wherein:

10 (a) the barrier is a vertical wall of the living space, the circulation plenum is defined on either side by the vertical wall and a second barrier wall, the living space is on the opposite side of the vertical wall; and

15 (b) said phase change material (PCM) component comprises a phase change material selected from the group consisting of a microencapsulated paraffin wax and a solid-state PCM.

15 15. The tile structure of claim 12 wherein:

(a) said fin protrusions are integrally molded with said inwardly directed surface and said base support member; and

20 (b) said fin protrusions have a shape selected from the group consisting of pin fin shaped, conical/cylindrical, tube-fin shaped, straight/rectangular, square pin shaped, circular/curvilinear, and an irregular shape.

16. The tile structure of claim 12 wherein:

25 (a) said fin protrusions are molded from an intermixture of said binder material and said phase change material (PCM) component, and permanently adhered to said inwardly directed surface of said base support member; and

(b) said phase change material (PCM) component comprises a phase change material selected from the group consisting of a microencapsulated paraffin wax and a solid-state PCM.

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